

AMERICAN ELECTRONICS ASSOCIATION TEXAS COUNCIL
16 FEBRUARY 1988

TECHNOLOGY TRANSFER
BY ROBERT M. GATES
DEPUTY DIRECTOR OF CENTRAL INTELLIGENCE

I WOULD LIKE TO TALK TODAY ABOUT TECHNOLOGY TRANSFER, SPECIFICALLY, TECHNOLOGY TRANSFER TO THE SOVIET UNION AND OTHER WARSAW PACT STATES. WHILE THE UNITED STATES AND ITS ALLIES HAVE SOUGHT TO PREVENT THE EXPORT OF MILITARILY USEFUL EQUIPMENT AND TECHNOLOGY TO THE WARSAW PACT FOR SOME 40 YEARS, TECHNOLOGY TRANSFER CONTINUES TO BE THE SUBJECT OF DEBATE AND DISHARMONY HERE AT HOME AND ABROAD. THE SUCCESS THE SOVIETS HAVE ENJOYED IN USING OUR KNOW-HOW TO DEVELOP AND ENHANCE THEIR OWN SYSTEMS POSES A GENUINE THREAT TO OUR NATIONAL SECURITY.

NOW, TECHNOLOGY TRANSFER IS NOTHING NEW TO RUSSIA. PERHAPS THE EARLIEST EXAMPLE OF MASSIVE TECHNOLOGY TRANSFER TO STRENGTHEN RUSSIA MILITARILY WAS DURING THE REIGN OF PETER THE GREAT AT THE END OF THE SEVENTEENTH CENTURY. PETER HIMSELF TRAVELED TO THE WEST -- TO SWEDEN, GERMANY, HOLLAND AND ENGLAND -- WHERE HE DREW THE PLANS OF WESTERN FORTIFICATIONS; WORKED IN A SHIPYARD; BOUGHT TWENTY FACTORIES, HIRED SOME 800 TECHNICAL

SPECIALISTS; AND TOOK HOME REMARKABLE KNOWLEDGE AND EXPERTISE ON MILITARY RELATED TECHNOLOGIES. THIS HAS BEEN REPEATED TIME AND AGAIN IN THE FOLLOWING THREE CENTURIES, RIGHT TO THE PRESENT DAY.

FROM THE SCOPE AND VOLUME OF TRANSACTIONS WE HAVE OBSERVED, IT IS CLEAR THAT THE SOVIET APPETITE FOR WESTERN TECHNOLOGY IS ENORMOUS. FOR EXAMPLE:

- TO IMPROVE DESIGNS OF FUTURE WEAPONS SYSTEMS AND TO HELP DEVELOP COUNTERMEASURES FOR WESTERN SYSTEMS, THE SOVIETS COLLECTED 6,000 - 10,000 HARDWARE ITEMS AND 100,000 DOCUMENTS EACH YEAR IN THE LATE 1970S AND EARLY 1980S.
- TO BOLSTER THE ACTUAL PRODUCTION OF WEAPONS SYSTEMS, THE SOVIETS ACQUIRED -- ILLEGALLY -- HUNDREDS AND IN SOME CASES THOUSANDS OF MACHINE TOOLS, COMPUTER, AND MICROELECTRONIC MANUFACTURING EQUIPMENT.
- TO ENHANCE THEIR OWN EQUIPMENT AND IN SOME CASES WEAPON SYSTEMS, THEY ILLEGALLY ACQUIRE AT LEAST 50 MILLION INTEGRATED CIRCUITS EACH YEAR.

IT IS IMPORTANT TO NOTE THAT ABOUT 60 PERCENT OF THE DOCUMENTS AND HARDWARE ACQUISITIONS CONSIDERED TO BE THE MOST

SIGNIFICANT TO THE SOVIETS ARE OF US ORIGIN. THESE ACQUISITIONS, HOWEVER, ARE NOT NECESSARILY COLLECTED IN THE UNITED STATES.

THE BENEFITS OF WESTERN TECHNOLOGY FOR THE WARSAW PACT HAVE BEEN TREMENDOUS.

- IN THE EARLY 1980S, FOR EXAMPLE, MORE THAN 5,000 MILITARY RELATED PROJECTS IN THE SOVIET UNION BENEFITED FROM WESTERN HARDWARE AND TECHNICAL DOCUMENTS EACH YEAR. OVER HALF OF THESE PROJECTS WERE IN THE ELECTRONICS AND THE ARMOR AND ELECTRO-OPTICS INDUSTRIES.
- IN TERMS OF SPECIFIC WEAPONS SYSTEMS, WE HAVE SEEN THE IMPACT OF PURLOINED WESTERN TECHNOLOGY IN SOVIET RADARS, GUIDANCE SYSTEMS, CRUISE MISSILES, ANTI-SUBMARINE WEAPONS, LASER-GUIDED ARTILLERY SHELLS, AND ANTI-TANK MISSILES, TO NAME ONLY A FEW.

THE SOVIET ACQUISITION EFFORT CONSISTS OF THREE DISTINCT, BUT SOMEWHAT OVERLAPPING CHANNELS. THE FIRST WE REFER TO AS THE OPEN SOURCE CHANNEL. WE ESTIMATE THAT EVERY YEAR NEARLY HALF A MILLION UNCLASSIFIED DOCUMENTS ON TECHNICAL SUBJECTS ARE ACQUIRED BY THE SOVIETS. THIS CHANNEL IS THE LEAST IMPORTANT IN TERMS OF MILITARY CRITICALITY, BUT IT IS USED TO SUPPORT AND IMPROVE THE TARGETING OF THE OTHER CHANNELS. OTHER THAN A MORE

THOROUGH REVIEW OF UNCLASSIFIED GOVERNMENT PUBLICATIONS, THERE IS LITTLE WE CAN DO TO PREVENT THE LOSS OF KNOW-HOW THROUGH THIS CHANNEL. THIS IS SIMPLY THE COST OF DOING BUSINESS IN A FREE SOCIETY.

IN TERMS OF DIRECT IMPACT ON STRATEGIC ISSUES, THE SECOND AND THIRD CHANNELS ARE MORE IMPORTANT. THE SECOND CHANNEL, WHICH FOCUSES ON THE DESIGN PHASE OF WEAPONS, IS RUN BY THE USSR MILITARY INDUSTRIAL COMMISSION AND SUPPORTS THE DEFENSE INDUSTRIAL MINISTRIES. THIS ACQUISITION CHANNEL OR APPROACH TARGETS SEEK ONE-OF-A-KIND MILITARY AND DUAL-USE HARDWARE, BLUEPRINTS, PRODUCT SAMPLES, AND TEST EQUIPMENT TO IMPROVE THE TECHNICAL LEVELS AND PERFORMANCE OF SOVIET WEAPONS AND MILITARY EQUIPMENT. THIS PROGRAM, ON WHICH THE SOVIETS SPEND ABOUT \$1.4 BILLION EACH YEAR, INVOLVES ESPIONAGE BY HOSTILE INTELLIGENCE OFFICERS -- PRIMARILY KGB -- OVERT COLLECTION BY BLOC OFFICIALS, ACQUISITION BY SCIENTIFIC EXCHANGE PROGRAM PARTICIPANTS, AND ILLEGAL TRADE-RELATED ACTIVITY. IN THE LATE 1970S AND EARLY 1980S, THIS PROGRAM REDIRECTED SOVIET TECHNICAL APPROACHES IN ABOUT 100 PROJECTS EACH YEAR FOR ONGOING WEAPONS SYSTEMS AND KEY MILITARY EQUIPMENT. IT ALSO INITIATED SEVERAL HUNDRED NEW RESEARCH PROJECTS ANNUALLY ON TOPICS THAT HAD NOT BEEN UNDER CONSIDERATION. THE PROGRAM RAISED THE TECHNICAL LEVEL OF SEVERAL THOUSAND DEVELOPMENTAL PROJECTS EACH YEAR. MOREOVER, IT ALLOWED ELIMINATION OR SHORTENED DEVELOPMENTAL PHASES OF MORE THAN A THOUSAND MILITARY RESEARCH PROJECTS EACH YEAR.

THE THIRD CHANNEL OR PROGRAM, FOCUSES NOT ON ACQUIRING TECHNOLOGY RELEVANT TO THE DESIGN PHASE BUT RATHER ON PRODUCTION ITSELF. THIS PROGRAM INVOLVES THE SOVIET MINISTRY OF FOREIGN TRADE AND SOVIET INTELLIGENCE SERVICES. THEY MANAGE AN ELABORATE TRADE DIVERSION PROGRAM TO OBTAIN -- LEGALLY AND ILLEGALLY -- DUAL-USE MANUFACTURING AND TEST EQUIPMENT FOR DIRECT USE IN SOVIET PRODUCTION LINES. THIS PROGRAM SEEKS EXPORT CONTROLLED COMPUTERS, MICROELECTRONICS, MACHINE TOOLS, ROBOTICS, AND OTHER EQUIPMENT TO INCREASE THE OUTPUT OF SOVIET DEFENSE-RELATED INDUSTRIES. THE SOVIETS USE WESTERN BUSINESSMEN AND TRADE BROKERS, DUMMY FIRMS, DECEPTIVE EQUIPMENT DESCRIPTIONS, FALSE LICENSES, AND OTHER METHODS TO ACQUIRE THIS EQUIPMENT.

THE SOVIET UNION HAS MADE GREAT STRIDES IN MICROELECTRONICS OVER THE LAST FEW YEARS BY RELYING ON THESE SCHEMES. THIS SOVIET PROGRESS HAS REDUCED THE OVERALL WESTERN LEAD IN MICROELECTRONICS FROM 10-12 YEARS IN THE MID-1970S TO 4 TO 6 YEARS TODAY.

AGAIN, IT IS IMPORTANT TO KEEP IN MIND TWO POINTS ABOUT THE SECOND AND THIRD CHANNELS I HAVE DESCRIBED:

-- FIRST, THE MILITARY INDUSTRIAL COMMISSION PROGRAM HAS ITS BIGGEST IMPACT IN THE DESIGN STAGE OF A SOVIET

WEAPON, WHILE THE TRADE DIVERSION EFFORT HAS ITS IMPACT IN THE PRODUCTION/DEPLOYMENT STAGES.

- SECOND, BECAUSE OF WHAT THEY COLLECT AND WHO COLLECTS IT, THE BEST DEFENSE AGAINST THE MILITARY INDUSTRIAL COMMISSION PROGRAM IS GOOD COUNTERINTELLIGENCE AND GOOD INDUSTRIAL SECURITY. THE BEST DEFENSE AGAINST THE TRADE DIVERSION PROGRAM IS EXPORT ENFORCEMENT.

I'D LIKE TO TURN NOW TO THE AMERICAN INTELLIGENCE COMMUNITY'S ROLE IN STEMMING THE FLOW OF MILITARILY-USEFUL TECHNOLOGY TO THE SOVIETS.

OUR PRIMARY ROLE HAS BEEN AS COLLECTORS AND ANALYSTS OF INFORMATION. TWICE IN THE PAST FEW YEARS WE HAVE MADE A LARGE VOLUME OF FACTS OPENLY AVAILABLE ABOUT THE SOVIET EFFORT TO ACQUIRE TECHNOLOGY, AND WE HAVE PROVIDED ANALYTICAL CONCLUSIONS ABOUT THE IMPACT OF THIS EFFORT ON THE EAST-WEST STRATEGIC BALANCE. SOME OF OUR ANALYSIS HAS MADE PEOPLE ANGRY, SOMETIMES AT US. FOR EXAMPLE:

- OUR DISCOVERY AND ANALYSIS OF THE MORE EGREGIOUS TECH TRANSFER CASES -- INCLUDING A RECENT ONE THAT HELPED THE SOVIETS QUIET THEIR SUBMARINES -- HAS CONTRIBUTED TO THE CONGRESSIONAL DRIVE TO MAKE COMMITTEE ON MULTILATERAL EXPORT CONTROLS (COCOM) A MORE EFFECTIVE ORGANIZATION.

- OUR RESEARCH SHOWING THAT KEY COCOM COUNTRIES LACK THE MEANS AND IN SOME CASES THE WILL TO ENFORCE EXPORT CONTROLS DID NOT MAKE US MANY FRIENDS OVERSEAS.
- OUR DATA SHOWING THAT THE SOVIETS STILL WANT US TECHNOLOGY AND EQUIPMENT MORE THAN ANY OTHER SOURCE IS CERTAINLY A VOTE OF CONFIDENCE TO US INDUSTRY. BUT IT NECESSARILY UNDERCUTS INDUSTRY EFFORTS FOR WIDESPREAD DECONTROL OF THEIR PRODUCTS.

OUR CONCLUSIONS HAVE EVOKED DIFFERENT REACTIONS FROM AMERICAN SCHOLARS, INTELLIGENCE OFFICERS, POLICYMAKERS, AND BUSINESSMEN. ALMOST EVERYONE AGREES, HOWEVER, THAT INDUSTRIAL ESPIONAGE -- WHERE THE WARSAW PACT ACTUALLY STEALS MILITARY AND MILITARY RELATED TECHNOLOGY -- IS HARMFUL AND US ACTION TO STOP IT AND PUNISH OFFENDERS IS NOT ONLY APPROPRIATE BUT NECESSARY AND LAUDABLE.

BEYOND THAT, THE AGREEMENT STOPS. THE GREAT DEBATE TENDS TO FOCUS ON WHAT AND HOW TO CONTROL DUAL-USE, UNCLASSIFIED TECHNOLOGY, EQUIPMENT, COMPONENTS, AND PRODUCTS. THIS GROUP IN PARTICULAR PRESUMABLY FEELS STRONGLY ABOUT PROBLEMS RELATED TO EXPORT CONTROLS.

OUR ROLE IN THIS DEBATE -- A ROLE THAT HAS GROWN MARKEDLY IN RECENT YEARS -- IS MAKING JUDGMENTS ON THE IMPORTANCE MOSCOW ATTACHES TO DIFFERENT TYPES OF MILITARILY CRITICAL TECHNOLOGY, NOW AND IN THE FUTURE. CIA'S WORK SHOWS THAT ILLEGAL ACCESS TO WESTERN TECHNOLOGY THROUGH VIOLATIONS OF EXPORT CONTROL LAWS HAS HAD A SIGNIFICANT IMPACT ON SOVIET WEAPONS SYSTEMS. THERE ARE MANY EXAMPLES.

- WESTERN MACHINE TOOLS ARE HELPING PRODUCE SOVIET SUBMARINE PROPELLERS AT A RATE AND QUALITY FAR BEYOND SOVIET CAPABILITIES.
- ACCESS TO WESTERN MICROELECTRONIC PRODUCTION EQUIPMENT HAS SOLVED SOME OF THE MAJOR QUALITY CONTROL AND YIELD PROBLEMS THE SOVIETS HAD FOR MILITARY-SPECIFIC INTEGRATED CIRCUITS (ICS).
- WESTERN COMPUTERS AND SOFTWARE HAVE GIVEN MOSCOW THE ABILITY TO DESIGN THEIR OWN MILITARY-SPECIFIC ICS.

FINALLY, AND PERHAPS MOST IMPORTANT, WE BELIEVE MOSCOW'S APPETITE FOR THIS TECHNOLOGY IS GROWING, PARTICULARLY IN THE AREA OF INFORMATION TECHNOLOGY. THE SOVIET STRATEGY APPEARS TO BE MODERNIZING THE ELECTRONICS-BASED SECTOR OF THE ECONOMY BEFORE MOVING TO INVEST MORE HEAVILY, IN THE 1990'S, IN MILITARY PRODUCTION FACILITIES.

IN THE EARLY 1980S, CONGRESS DIRECTED THAT CIA ENSURE THAT ALL RELEVANT INTELLIGENCE WAS BEING FACTORED INTO EXPORT LICENSING DECISIONS. IN RESPONSE TO THIS, THE TECHNOLOGY TRANSFER ASSESSMENT CENTER AT CIA SET UP AN EXTENSIVE ALL-SOURCE DATABASE ON FOREIGN DIVERTERS OF TECHNOLOGY WHICH WE USE TO ADVISE THE COMMERCE DEPARTMENT AND OTHERS IN THE EXPORT CONTROL COMMUNITY ON THE RISKS OF DIVERSION.

OUR SOURCES ARE VARIED AND EXTENSIVE. THROUGHOUT THE EXPORT CONTROL COMMUNITY, THE KEY SOURCES ARE US BUSINESSMEN WHO PROVIDE TIP-OFFS ON POTENTIAL DIVERTERS AND QUESTIONABLE SALES INQUIRIES. WITHOUT THIS INFORMATION THE COMMUNITY WOULD BE SERIOUSLY HANDICAPPED.

NEITHER THE UNITED STATES NOR COCOM CAN STOP THE SOVIET UNION FROM ACQUIRING WESTERN TECHNOLOGY. RATHER, THE GOAL IS TO SLOW THE ACQUISITION OF MILITARILY CRITICAL TECHNOLOGY BY THE SOVIETS TO A RATE THAT MORE CLOSELY RESEMBLES THE PACE OF INDIGENOUS DESIGN, DEVELOPMENT, PRODUCTION, AND DEPLOYMENT IN THE SOVIET UNION. THE KEY ASSUMPTION, HOWEVER, IS THAT COCOM -- PARTICULARLY THE UNITED STATES -- CAN DETERMINE "WHAT IS CRITICAL" SO AS TO DETERMINE WHAT CAN AND SHOULD BE CONTROLLED.

WE HAVE DEVELOPED A MEANS TO SIMULATE THE SOVIET DECISIONMAKING PROCESS FOR WEAPONS DESIGN, DEVELOPMENT,

PRODUCTION, AND DEPLOYMENT, WHICH OVER RECENT HISTORY HAS BEEN FAIRLY PREDICTABLE. USING THIS SIMULATION, WE HAVE FORMULATED A LIST OF SOVIET MILITARY SYSTEMS -- CURRENT ONES TO BE ENHANCED OR NEW ONES ABOUT TO ENTER PRODUCTION OR TESTING. CIA WEAPONS ANALYSTS THEN DEVELOPED A LIST OF TECHNOLOGIES -- IN PRIORITY ORDER -- NEEDED TO ACHIEVE PERFORMANCE LEVELS. FROM THAT LIST, CURRENT SOVIET CAPABILITIES ARE SUBTRACTED TO DETERMINE WHAT MOSCOW NEEDS FROM THE WEST. WHAT IS LEFT IS A LIST THAT COCOM SHOULD CONSIDER CONTROLLING, IN A PRIORITY ORDER OF IMPORTANCE FROM MOSCOW'S VIEW. THE FINAL COMPOSITION OF THE LIST IS A POLITICAL DECISION.

OUR EVIDENCE SHOWS A STRONG UNDERPINNING OF SUPPORT FOR A CONTROL SYSTEM THAT US BUSINESS BELIEVES IS FAIR AND THAT CONTROLS MILITARILY CRITICAL ITEMS. THE SAME HOLDS TRUE FOR OUR ALLIES. WHENEVER THE UNITED STATES HAS APPROACHED COCOM WITH EVIDENCE THAT A PRODUCT OR TECHNOLOGY IS BEING USED OR COULD BE USED IN A SOVIET WEAPONS PROGRAM OR MILITARY SYSTEM, WE HAVE RECEIVED STRONG SUPPORT.

LIKewise, WE NEED YOUR CONTINUED SUPPORT, BOTH AS A SOURCE OF INFORMATION ON TRADE DIVERTERS AND AS A SOURCE OF INFORMATION ON TECHNOLOGICAL ISSUES. WE NEED TO TALK TO PEOPLE WHO ACTUALLY TRANSLATE TECHNOLOGY INTO ENGINEERING DIAGRAMS AND PRODUCTION EQUIPMENT. WE NEED TO HAVE ACCESS TO PEOPLE WHO ACTUALLY BUILD WEAPONS SYSTEMS WITH THE DUAL-USE EQUIPMENT ON THE CONTROL LIST.

CIA WILL CONTINUE TO PLACE A HIGH PRIORITY ON THE TECHNOLOGY TRANSFER ISSUES. AS I INDICATED, WE HAVE EVERY REASON TO BELIEVE THAT SOVIET INDUSTRIAL ESPIONAGE WILL INTENSIFY IN THE 1990'S. AND THE SOVIETS WILL CONTINUE TO DEVOTE WHATEVER RESOURCES AND MANPOWER ARE NECESSARY TO FULFILL THEIR MOST CRITICAL MILITARY COLLECTION REQUIREMENTS.

YOUR CONTINUED SUPPORT AND COOPERATION IN STEMMING THE FLOW OF CRITICAL TECHNOLOGY TO THE SOVIET UNION AND OTHER WARSAW PACT STATES IS A KEY PART OF OUR EFFORT. THANK YOU.